

## ABSTRACT

The present invention is a CMOS image sensor and its method of fabrication. This invention provides an efficient structure to improve the quantum efficiency of a CMOS image sensor with borderless contact. The image sensor comprises a N-well/P-substrate type photodiode with borderless contact and dielectric structure covering the photodiode region. The dielectric structure is located between the photodiode and the interlevel dielectric (ILD) and is used as a buffer layer for the borderless contact. The method of fabricating a high performance photodiode comprises forming a photodiode in the n-well region of a shallow trench, and embedding a dielectric material between the ILD oxide and the photodiode having a refraction index higher than the ILD oxide.